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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • MAY 22, 1948

Important Step

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A SCIENCE SERVICE PUBLICATION

MEDICINE

New Test for Hookworm

Quantitative evaluation makes possible more accurate prescription of drugs for treatment of this and other worm diseases.

➤ A NEW diagnostic test which will help toward better treatment of diseases afflicting hundreds of millions of people throughout the world was announced at the Congress of Tropical Medicine and Malaria in Washington, D. C.

The diseases are hookworm and the fluke-caused sickness called schistosomiasis. The test would probably be effective for any disease in which worms or flukes get into the body and give off eggs. It was devised by Drs. Elmer H. Loughlin, Samuel H. Spitz, Richard H. Bennett and Jerome P. Margolies of Long Island College of Medicine, Brooklyn.

With this test, doctors will be able for the first time to tell exactly how many hookworms or blood flukes are in the patient's body. He can then prescribe much more exactly the amount of medicine needed to free the patient of the worms or flukes, and get him well.

The test also makes possible for the first time accurate diagnosis of these diseases in patients having only a light infection. This will help many who come back from the tropics with a vague intestinal disorder that baffles the doctor and does not get better under ordinary treatment. But with the new test, the doctor can find out exactly what does ail the patient and give a drug that will cure him.

Schistosomiasis is found in Egypt, many Mediterranean countries, China, Japan and the Philippines. The flukes are carried by snails. Humans get them from drinking or bathing in infested waters. Some 85,000,000 persons throughout the world are afflicted with this condition and another 457,000,000 have hookworm, according to surveys based on previous tests for the disease. But these tests only showed heavy infections. If the light infections that can be detected by the new test were found, the total figures would be very much higher.

One out of every three or four persons in the United States is probably carrying some kind of worm or fluke or ameba in his body, the Long Island doctors estimate. They base this on the numbers they are finding in Brooklyn with their new test. Many who have these worms and other parasites do not know it and may not even be sick. But there is danger of their spreading the diseases, just as healthy carriers of typhoid germs can unknowingly spread that disease.

Tests for the fluke and worm diseases all depend on finding the eggs in the intestinal wastes. The new test concentrates the eggs, so that even if there are only a few, they will be detected. Since it is quantitative, and since scientists know how many eggs a female hookworm, for example, will discharge in a day, the test gives the number of worms in the patient's body. The shape, size and structure of the eggs, seen under the microscope, tell which kind of worm or fluke the patient is harboring.

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CONSERVATION

China Has National Park

What may be the first of a park system like ours includes a special area for preserving the "dawn sequoia" trees previously known only from fossils.

➤ CHINA has made the beginning of what may grow into a National Park system like that of the United States, by setting aside a special area for the conservation of the recently discovered "dawn sequoia" trees in the Valley of the Tiger. Announcement of this move was made simultaneously in China and at the University of California, where Prof. Ralph W. Chaney, first occidental botanist to set eyes on the trees, is now growing seedlings for planting on this side of the Pacific.

A Metasequoia Conservation Committee has been set up, with members representing this country as well as China. American members, in addition to Prof. Chaney, are J. Leighton Stuart, U. S. ambassador to China, and Dean Roscoe Pound of the Harvard Law School, who was a front-rank botanist before he decided to make the law his career. Chinese members are the philosopher Hu Shih, former ambassador to Washington, Wong Wen Hao, advisor to Chiang Kai-Shek, and Han Lih Wu, vice minister of education.

The "dawn sequoia," a species previously known only from fossils and supposed extinct for at least 20,000,000 years, was recently found alive in the deep interior of China. A few weeks ago Prof. Chaney made a special journey to see it, starting by flying across the Pacific and winding up by tramping dozens of miles over muddy mountain trails.

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MEDICINE

Change in Fluid Balance May Kill Malaria Victims

➤ A CONTRIBUTING cause of death in malaria may be a change in fluid balance in the body and not the malaria germs themselves. Studies with monkeys and humans suggesting this were reported by Dr. Richard R. Overman of the University of Tennessee College of Medicine.

The same condition may be the cause of the debility after an attack of malaria, Dr. Overman thinks.

During the attack of malaria, he finds, the walls of the body's cells become more permeable. Substances get inside the cells which normally should not be there. Dr. Overman believes the intermittent fever of malaria is what makes the cell walls permeable. The same thing may happen, he suggests, in other diseases with fever that comes and goes.

The cell permeability can be reversed by treatment with anti-malaria chemicals. But if the condition becomes serious enough, it is no longer reversible. This was the case in monkeys and Dr. Overman believes it also occurs in humans. Monkeys given anti-malarial chemicals after the fluid upset had become serious died, though the chemicals had killed all the malaria parasites.

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MEDICINE

Better than Morphine

Metopon, derived from opium, relieves pain of dying cancer patients. Is habit-forming, but addiction builds up less rapidly. Methadon even better.

➤ A DRUG better than morphine for stopping the intense pain of dying cancer patients is now available. Called metopon, it is derived from opium, like morphine. It is habit-forming like all opium drugs, but addiction to it builds up more slowly.

This latest step in man's conquest of pain was reported by Dr. Nathan B. Eddy, of the U. S. National Institute of Health, Bethesda, Md., speaking before the analgesics conference of the New York Academy of Sciences.

"Metopon has no equal for oral (mouth) administration for chronic pain," said Dr. Eddy, "if its use is started before tolerance and dependence on other narcotics have developed."

The patient being treated with metopon does not get as much feeling of well-being (euphoria) as injections of morphine would give him. Tolerance to the drug, making larger and larger doses necessary, develops more slowly than with morphine.

Metopon is made from opium by a "distressingly complicated process," Dr. Lyndon F. Small, National Institute of Health chemist, told the conference.

For over a decade chemists have attempted to produce a drug as effective as morphine in stopping pain without morphine's ability to make addicts of its users. Metopon does not quite succeed in this respect. No active morphine derivative has yet been made which is free of addiction liability.

Given by mouth metopon has given fair or better relief of pain in the last stages of cancer in 74 out of every 100 patients, Dr. Eddy reported. In those patients who had not previously been given morphine or related substances, metopon gave fair or better pain relief in 91 out of every 100 patients.

Metopon, being an opiate, comes under the control of the Federal narcotic drug laws. In order to make doubly sure that it would not be misused and create new drug addicts, it has been released only for use to relieve chronic pain in cancer patients. This was possible because the patent for the drug was assigned to and is now owned by the United States government. The distribution procedure provided also for doctors prescribing it to supply Dr. Eddy with information on results of its use.

Methadon Superior

Best drug so far, for the relief of pain in dying cancer patients is the synthetic drug, methadon, known also as amidone and dolophin.

Its superiority among a group of four new pain-killing drugs tested at Memorial Hospital was reported by Dr. J. S. LaDue at the same conference.

The other three drugs tested were two known only as NU 896 and NU 1196 and metopon.

Methadon is superior in some respects to the opiates, which include morphine itself, Dr. LaDue reported. One of its advantages is that it does not produce euphoria, or a feeling of well-being, except in very large doses. Small doses of opiates uniformly produce euphoria.

For nervous, apprehensive patients, however, the lack of euphoria is a disadvantage.

Methadon, which is definitely a narcotic drug, is just about ready for release, Dr. LaDue said.

A dozen or more new pain-killing drugs are still waiting to be tested. The Memorial group expects to try these as soon as possible in the hope of finding the ideal pain-killer for cancer patients.

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AERONAUTICS

Afterburner Adds Speed

➤ A RAM-JET-LIKE device called an afterburner, which is attached on the exhaust of a jet-engined airplane to give special spurt when needed, will be installed on Navy Pirate fighting planes, it was revealed by Solar Aircraft Company. Under present plans many of the Navy's Chance Vought XF6U-1 Pirate fighters will be equipped with this auxiliary jet unit.

The afterburner being installed is a cylindrical device eight feet long which is attached on the exhaust nozzle of the Westinghouse turbo-jet engine which powers this plane. Fuel is injected into the cylinder into the gases from the turbo-jet engines, which contain a surplus of oxygen. Combustion immediately takes place, and the gases formed under pressure add extra thrust which increases proportionately with the speed of the aircraft.

The ram-jet has been called the flying stovepipe because of its simple shape. It operates somewhat similarly to the turbo-jet but has no turbines or moving

AFTERBURNER—This cylindrical device on the rear will be installed on Navy Pirate fighting planes.

parts. When traveling through the atmosphere, it operates only after acquiring enough speed from some other source to pick up sufficient air under pressure to produce combustion with fuel fed into its tapering cylinder. In the afterburner the oxygen for combustion is provided in the exhaust from the turbo-jet itself.

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METALLURGY

German Magnetic Alloy Now Made in America

➤ A FORMER German magnetic alloy, particularly suitable for use in rectifiers to change alternating electric current into direct current, has now been produced for the first time in the United States at the Naval Ordnance Laboratory, White Oak, Md., the Department of the Navy revealed.

This valuable alloy, known as Permenorm 5000-Z, is a result of a fusion of nickel and iron under an intricate heat-treatment process. It was first made in Germany in 1943, where it was applied in the electrochemical industry in the construction of huge rectifiers.

Unfinished samples of the new alloy were brought to this country after the close of the war by American scientists, and distributed to American governmental and industrial laboratories to be duplicated for domestic uses. Although details of the process were available, no laboratory until now was successful in producing the type of alloy which had the required magnetic properties.

Permenorm 5000-Z has important applications in the fabrication of magnetic amplifiers to give additional strength to feeble electrical pulses. Employed for this purpose, it may replace many of the complicated, delicate and troublesome electronic tube amplifiers now used in guided missiles, equipment to control gun firing, and underwater ordnance.

Credit for the reproduction of the alloy and its new applications goes to Dr. Gustaf W. Elmen and Edward A. Gaugler, physicists at the Naval Ordnance Laboratory. Dr. Elmen, well-known as the inventor of other magnetic alloys, served as consultant, while Mr. Gaugler was actively in charge of the project. At a scientific meeting to discuss magnetic materials, to be held at the Naval laboratory in the near future, the Permenorm development will be described at length.

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MEDICINE

Hope for Amputees

New suction socket makes walking more comfortable and easy for those who have lost legs. New arms make it possible to shave self or drive truck.

See Front Cover

➤ SUCTION SOCKET that makes an artificial leg feel like part of the amputee's own body. A hook so controllable that it can pick up a marshmallow or a hamburger. A natural looking dress hand, with thumb motion, that will cost a fourth or a sixth the price of present motionless dress hands.

These are among the new artificial arms, legs and hands and hooks demonstrated at the National Academy of Sciences. They were developed by governmental, industrial and university laboratories in a program sponsored by the Army, Navy, Air Forces and Veterans Administration and coordinated by a National Research Council Committee.

Certificates of appreciation were presented in Washington by Secretary of the Army Kenneth C. Royall to 15 of 27 amputees who have tested the devices and made valuable suggestions for improvements. The other 12 are receiving their certificates at ceremonies in other parts of the country.

At least 200 of the suction sockets have already been successfully fitted. The second phase of the experimental program, now being started, will supply about 450 more. The socket holds the leg on by suction, created by the intake and outgo of air as the amputee walks. It replaces the heavy belt around the hips now used to hold on artificial legs. Besides feeling comfortable, the suction socket actually builds up the leg, or stump, in contrast to the pale, anemic condition that may develop with present leg attachments.

The young veterans shown on the cover of this week's SCIENCE NEWS LETTER are demonstrating that with the new leg it is possible to put the weight of the body on the artificial leg when going downstairs. This has been impossible with the older types, as has also putting the foot flat on the step. Suction socket with combination valve and knee flexion and ankle rotation with some lateral motion make this possible.

"The hook of the future" is the enthusiastic description given by Pfc. Leo J. Qualiotto, Cleveland, to the one that picks up a marshmallow. Mr. Qualiotto has been testing hooks, hands and arms since October, 1946. Officially it is known as the Army Voluntary Hook. Its advantage is that the user can control the closing and pressure of the hook, using whatever degree of grip he wishes.

The dress hand with movable thumb

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can be used to hold a telephone or a cigarette, to write and to perform a few other functions. Even more useful will be another Army dress hand with movable fingers as well as thumb.

Important advance for the person without hands is the new wrist flexion unit. This allows 22.5 degrees extension and 45 degrees flexion, or bending. With the 45 degree flexion, the hook can be brought right up against the body, which makes shaving and unbuttoning a shirt possible, explained Jerry Leavy, of Los Angeles, one of the testers for the artificial limb program. Mr. Leavy, incidentally, has become so proficient in the use of his two artificial arms that when he applied for a license to drive a station wagon, he finished up with a license for driving a truck.

The wrist flexion unit can be attached to any standard artificial arm. It has been released to the Veterans Administration and will be ready for the market as soon as VA puts through its procedures for releasing it.

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ENTOMOLOGY

Effects of Insecticides Need Study for Best Use

➤ CHEMISTS have been providing deadly insecticides so fast, of late years, that entomologists have not yet been able to find out their most effective uses, Dr. T. Walter Reed of the California Spray-Chemical Corporation, Haddonfield, N. J., told an American Chemical Society meeting in Bristol, Va.

DDT, benzene hexachloride, chlordane, chlorinated camphene and other insect-killing compounds are now being used in mixtures instead of "straight," he stated. A mixture of DDT, benzene hexachloride and sulfur, for instance, has had maximum effect on boll weevil. Locust plagues may be made a thing of the past through airplane use of chlordane, chlorinated camphene and benzene hexachloride.

But above all, field scientists must study the effects of their new weapons beyond the immediate attack on specific pests. There is always some offsetting disadvantage, in the destruction of beneficial insects or other useful life forms, and it will require great knowledge and care to see that the bad does not overbalance the good.

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AERONAUTICS

Flight Training on Ground

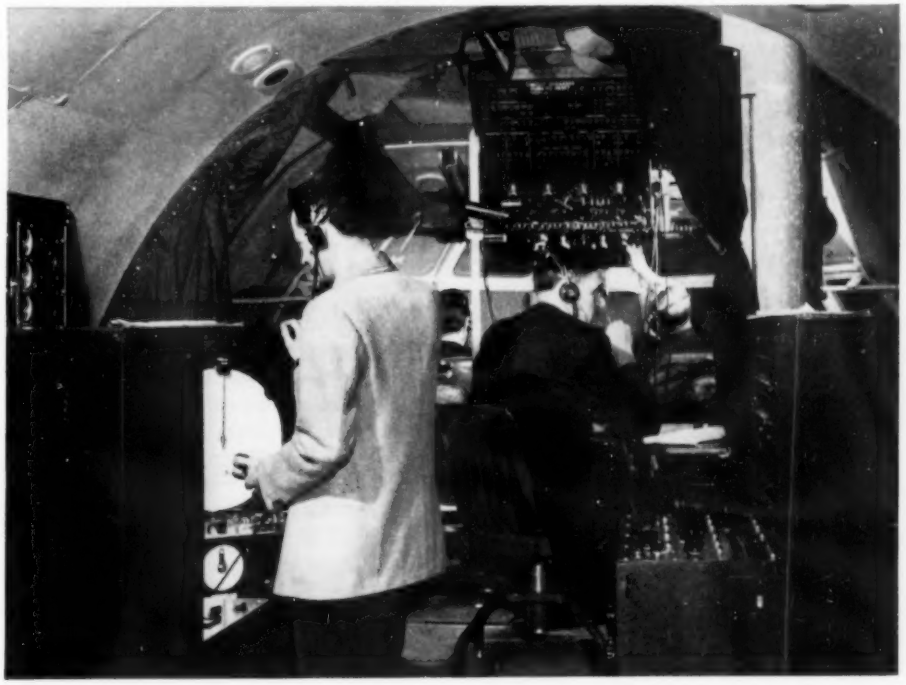
Electronic Flight Simulator duplicates in exact detail the cockpit of a Stratocruiser with electronic devices for simulating flight conditions.

➤ PILOTS of the future, particularly those who handle giant passenger airplanes, will receive much of their training without leaving the ground. This will be the training that has to do with operation techniques, and the ground-training is made possible by the development of a huge electronic-mechanical device in a model of a cockpit with all the hundreds of dials, levers, switches and controls which a pilot encounters in a plane.

This device is called the Electronic Flight Simulator. It reproduces in exact detail the flight deck or cockpit of the airplane whose performance it is designed to reproduce. It incorporates all the existing aerodynamic data upon which the plane itself was produced. Without leaving the ground, it can accurately simulate any condition of flight of which the plane itself is capable.

The simulator was conceived and designed by Dr. R. C. Dehmel of the Curtiss-Wright Corporation, with the cooperation of Boeing Aircraft Company. It is a complete replica of the Boeing Stratocruiser-type giant transport cockpit. The instruments and controls function precisely as in the real airplane. The device has just been purchased by Pan American Airways, and will be used in pilot training for handling Pan American Stratocruisers. Similar simulators can be built to aid in training for other planes.

This flight simulator cost some $250,000 to build, and this does not include the cost of ten years of research work which preceded its actual construction. It looks like a lot of money to put into



***SIMULATED FLIGHT**—Instructor supervises a simulated flight in the Curtiss-Wright Dehmel Electronic Flight Simulator with a Pan American World Airways crew in an exact duplicate of the cockpit of the Boeing 377 Clipper. On the left, the instructor watches the "scriber" trace the performance of the crew. The flight engineer, center, checks his engine instrument readings and reports to the pilot.*

one training device, but as a "training plane" it can handle four times the number of flight and ground crews at a tenth the cost and in a fraction of the time involved in the use of an actual airplane.

One important feature of this new flight simulator is that the entire operating crew, pilot, co-pilot, engineer and others, are trained at the same time. An instructor behind them operates switches which activate the pilot's dials to indicate trouble with fuel flow, wrong oil pressure, carburetor icing, faulty spark plugs and other difficulties. Pilot response is noted by him, and also the corrective action taken.

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NUCLEAR PHYSICS

Future Atomic Advances

➤ EXPERIMENTAL atomic power plants "within a year or two" and ships running on atomic energy "within a decade" were forecast by a famous American atomic scientist.

The scientist is Dr. Edward U. Condon, director of the National Bureau of Standards, who has been under attack from a subcommittee of the House Un-American Activities Committee. Dr. Condon's views on the future applications of atomic energy are given in a report to the American Institute of Electrical Engineers in New York. (March 10)

"Three atomic power plants are now under way—at Oak Ridge, Tenn., Chicago, Ill., and Schenectady, N. Y.—and it should be possible to realize experimental production of power within a year or two," the atomic scientist forecast.

For cars, planes or even railroad locomotives, atomic power plants are likely to be too heavy, he believes.

"However, it is reasonable to suppose that within a decade some ships may derive their power from (atomic) piles."

Other atomic advances expected by Dr. Condon include better ways of producing the atomic bomb elements uranium 235 and plutonium, smaller-sized chain-reacting piles, important "special purpose energy sources" and aids in medical and other scientific work.

Whether or not other elements can be used to release atomic energy "can be decided only by future research," declares the scientist.

"At present no means of doing this is in sight, but it should be remembered that in 1938 the atomic bomb would have seemed fantastic to the best nuclear physicists."

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CHEMISTRY

Fresh Water from Ocean

➤ SCIENTIFIC research to make fresh water from sea water is proposed by a bill introduced in Congress by Rep. Charles K. Fletcher, R., California, which would place the study in the hands of the Navy.

The measure would authorize the Secretary of the Navy to construct, and operate one or more demonstration plants to produce potable water from sea water, or other liquids, elements or substances. These plants would be of a size to provide engineering data for industries desiring to convert salt water to fresh for manufacturing and other purposes.

De-salting sea water has long been carried out by the ordinary distillation process on shipboard and other places. This of course requires considerable fixed equipment. During the war there were several de-salting methods developed primarily for use on lifeboats and life rafts which required only such equipment as could be easily stored with other supplies in the boats and rafts.

The outstanding method uses a new chemical de-salter. It is a product of Permutit Company of New York. A briquet of it, the size of a small candy bar, is dropped into a plastic bag containing sea water. It absorbs the chemical salts in the sea water so that they can be filtered out as the water is sucked through a plastic tube. Each briquet weighs only one-sixth as much as the drinking water produced and takes up only one-tenth as much space. One briquet is good for about a pint of drinking water. The entire kit for a life raft is the size of a small hand-bag.

The principle employed in this and other de-salting methods is what is known as ion exchangers. These cause an interchange of ions between the material in solution and the solid introduced. The process is used in water softeners. The particular type used to freshen sea water is known as anion exchangers or acid absorbers. They absorb the acids formed when a salt containing water is passed through a hydrogen exchanger.

During the war scientists at the Naval Medical Research Institute tested a dozen or so de-salters suggested for downed flyers on life rafts. Most of them were rejected as unsatisfactory for one reason or another.

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PHYSICS

Measure Water Vapor in Gases by Improved Means

➤ A WARTIME need for a quick method to determine the dryness of aviators' oxygen led the National Bureau of Standards to develop an improved electrical method for measuring small amounts of water vapor in many kinds of gases and the moisture content of certain liquids and solids.

The method has just been made public. Essentially it depends upon the change in electrical resistance of an electrolytic film as it absorbs vapor. It is a procedure carried out with speed, simplicity, high sensitivity, and wide range. It was developed by E. R. Weaver of the Bureau staff.

The principle utilized has been employed at the Bureau in various devices for some time. A thin film of liquid, which may be phosphoric acid or a solution of sulfuric acid or other electrolytic compounds in a gelatin or plastic binding material, is spread over the surface of a solid insulator between metallic electrodes. The electrolyte absorbs moisture and tends to reach equilibrium with the water vapor in the surrounding gas and to form a solution the electric conductance of which is a measure of the concentration of water vapor in the gas.

In the improved method, the electrical resistance of a film in the gas of unknown moisture content is compared with one in a sample gas containing a known amount of water vapor. By adding measured moisture to one or the other a balance can be obtained, and the moisture content of the unknown quickly determined.

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The rare *trumpeter swan* is appearing in southern Alaska in growing numbers.

PSYCHOLOGY-FORESTRY

Spotting Forest Fires

Men with exceptional eyesight can see the thin wisp of smoke that signals a starting fire at a distance of nearly 16 miles. Four miles gained by haze cutter.

➤ HOW far away would you be able to see the tell-tale wisp of smoke that means the start of a forest fire?

Some of Uncle Sam's forest fire fighters with exceptional eyesight could spot it at a distance of nearly 16 miles. This is revealed in a report by George M. Byram and George M. Jemison of the Southeastern Forest Experiment Station.

Keen eyesight is very important in spotting fires. The man with keen vision can see about 10% farther than the man with only average eyesight. This 10% reduction in distance might mean a 35% increase in the size of a fire before it would be spotted by the just average man.

A special eyesight test has been developed for picking fire spotters. It does not have the familiar "E's" and other letters on it but measures your ability to see a single black spot 1/16 inch in diameter on a sheet of white paper seven inches square. If you could see a dot the size of one of the letters in this type at a distance of 72 feet, you, too, could spot a beginning forest fire more than 15 miles away.

That is, you could if there was not too much haze and if the smoke were the right color. Haze cuts down greatly on the distance at which you can spot smoke. But the color of the smoke is important, too. Dry fuels give off darker or less smoke than do wet fuels. The blue, thin smoke from a dry grassy hillside has less contrast with its background and so is much harder to see than the white smoke from a moist area.

About four miles can be gained in visibility range for white smoke on a day when haze would normally limit vision to about 10 miles. This is accomplished by use of a "haze-cutter." Ordinary colored filters do little or no good except to cut down the glare in the observer's eyes, the investigators found. But the haze-cutter takes advantage of the fact that the light from haze is polarized while white smokes give off unpolarized light. The haze-cutter is a polarizing screen turned so as to cut off polarized light, thus making the white smoke show up in contrast to the background. To use it on thin blue smoke, which is almost completely plane-polarized, you just use the haze cutter in reverse, letting it transmit the polarized light.

Other ways in which things can be made easier on the eyes of Uncle Sam's fire spotters, include providing them with goggles that cut down the bright light that tires the eyes, painting the inside of lookout houses white with lower walls and floors a dark color to cut down contrast with the outdoors, and using plate glass at eye level slightly tilted to improve visibility and eliminate glare.

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NUTRITION

Revise Nutrition Yardstick

Daily allowances lower for sedentary workers, but protein recommendations remain unchanged. To study further the amount of thiamin needed.

➤ THE nation's nutrition yardstick got revised downward somewhat by the Food and Nutrition Board of the National Research Council meeting in Washington.

Daily calorie allowances for sedentary men and women, for example, are now 100 calories lower than the previous recommendations of this group. For the individual man or woman this change seems small. It amounts to about one ounce less of sugar per day or about two less slices of bread. But when multiplied by the number of sedentary men and women in the population, the figure would amount to quite a contribution toward feeding the hungry world.

The point stressed by the board in reducing the recommended calorie allowance was that the original figure has been shown by studies since 1941 to be higher than people actually need. Eating up to the allowance might cause too much weight increase for good health.

Recommended allowances for protein (from meat, fish, eggs, cheese and the like), and for vitamin A and iron were not changed from those originally recommended by this group shortly before the start of the war.

A reduction in thiamin, or vitamin B_1, allowance, recommended by the board's committee on dietary allowances, was referred back to the committee for further study.

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TECHNOLOGY

Nylon Carpet Is Durable And Easily Cleaned

➤ CARPETS of nylon are now available for home use. They offer a luxurious floor covering that should endure for many years.

Because du Pont nylon is easily cleaned with soap and water, the carpet responds readily to shampoo treatment. Spots can be cleaned at home.

When cleaned and stored, the new carpet will need no special protection from moths. Nylon does not attract these destructive pests. Pre-shrunk, these carpets are manufactured by the Nye-Wait Company of Auburn, N. Y.

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NYLON RUG FOR THE HOME—** **It promises to be long-lasting, abrasion-resistant and easy to clean.

AGRICULTURE

Helicopters Used to Dust Wheat Fields with 2,4-D

➤ HELICOPTERS and airplanes were used to distribute weed-killing 2,4-D over wheat fields in the neighborhood of Dodge City, Kansas, Sunday, May 16. It was the first large-scale use of 2,4-D to kill weeds among the wheat ever undertaken in this country.

Special interest attaches to the use of helicopters for this work. Sprays released from airplanes elsewhere in this country have been partly wasted through drifting down the wind, and in the South a good deal of trouble was caused by the injury and killing of cotton plants by these unintended doses of the chemical. If the down-thrust of the helicopter rotors can make the 2,4-D spray "stay put," it may solve what has grown to be a major dilemma in weed-killing.

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PHYSIOLOGY

Smoking Produces Tremor In Fingers if You Inhale

➤ SMOKING even half a cigarette will make your fingers tremble—if you inhale. This was shown by experiments on 100 college students at Athens, Ga., of whom 50 were smokers and 50 non-smokers.

The smokers show more finger tremor as a result of the smoking than do non-smokers, Dr. A. S. Edwards, of the University of Georgia, who conducted the experiment, reports in the current issue of the *Journal of Applied Psychology*. This he attributes to the fact that the habitual smoker generally inhales. For non-smokers, the finger trembling went up 18%. For smokers the increase was 39%.

In another experiment, the students took eight puffs on a cigarette in a minute. Habitual smokers showed an increase of 84%. For the non-smokers, this time, it was noticed which inhaled and which did not. The inhalers among the non-smokers averaged 129% and for seven of these the average ran as high as 272.3%. Compare this with 9.9% for the non-smokers who did not inhale! Neither was any tremor increase noticed after the students had sat in a smoke-filled room, provided they did not do the smoking.

What causes the tremor? Is it the nicotine? To test this point, the students were given nationally advertised "denicotinized" cigarettes. Results were practically identical as with the standard tobacco. But when cornsilk was used no increase in tremor resulted even after an hour of smoking. The cornsilk was smoked in pipes, because the students had difficulty in making cigarettes of it.

Dr. Edwards also tested out the claim made by some students that they should not be expected to go through a two-hour examination without a smoke. After two hours of deprivation of cigarettes, the finger tremor was measured. If there was any nervousness as a result of going without smoking it did not show up in trembling finger tips.

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NUTRITION

Rice-Eaters Susceptible To Hidden Hunger Diseases

➤ RICE-EATERS are more likely to suffer hidden hunger diseases than wheat-eaters, Dr. W. R. Aykroyd, director of the nutrition division of FAO, told the International Congress on Tropical Medicine and Malaria meeting in Washington.

The reason is not any deficiency in rice itself. Husked rice, Dr. Aykroyd said, is about as nourishing as other cereals in the same state. But processes between harvesting and eating of rice rob it of many of its nourishing substances.

Making a bad situation worse, the rice-eaters of the world depend much more heavily on rice for their chief food than wheat-eaters depend on wheat. Almost three-fourths (70%) of the total calories in the rice-eater's diet come from rice. This is just too much rice. Even if the rice is enriched or specially processed to contain thiamin and other vitamins, rice-eaters would still suffer from diet deficiency diseases.

They would be better nourished if they ate more meat, milk, eggs, and fish. Rice-eaters, however, are generally poor and live where the land is so densely populated that very little if any can be spared for cattle pasturage. So they are not likely to get more meat, milk and eggs in the near future.

An immediate practical way of improving their diet, Dr. Aykroyd suggested, would be to eat more fish, pulses, beans, vegetables, fruits, roots and tubers, rice polishings, food yeast and coconuts. The available supply of pulses, vegetables and fish could be increased in most rice-eating countries in a relatively short time.

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IN SCIENCE

PALEONTOLOGY

Ancient Fossils Found In Pre-Flooding Surveys

➤ SIXTY-MILLION-YEAR-OLD fossils, dating back to the last days of the dinosaurs, are being turned up in quantity by scientists making surveys of areas that are to be permanently flooded when the new reservoirs now projected are completed. Thus far, 94 such reconnaissance surveys have been made in the Missouri river basin, and promising sites for digs by trained paleontologists have been marked for exploration before the waters rise.

Surface scrapings have turned up many fossil fragments of primitive horses, tapirs and lower primates belonging to the beginning of the Age of Mammals. Somewhat earlier, contemporary with the last of the dinosaurs, is the three-foot shell of a soft-shelled turtle, found on the Big Horn river near Shoshone, Wyo.

Science News Letter, May 22, 1948

ANIMAL HUSBANDRY

Famed Holstein Bull Dead; Sired 15,000 Offspring

➤ RAG APPLE, a famous Holstein bull credited with siring more than 15,000 sons and daughters through artificial insemination, is dead. A post mortem disclosed a small piece of wire in his intestinal tract.

Rag Apple was owned by the New York Artificial Breeders' Cooperative in Ithaca, N. Y. He had been in service for three years four months. Dairy specialists look for an increase in the production of thousands of dairy herds which boast descendants of the famed bull.

Had Rag Apple stayed in natural service during this period, his ability to transmit high production would probably have been limited to slightly more than 100 offspring, it is estimated.

Rag Apple's record is one that few if any bulls in the world have equalled. His reputation went far beyond state boundaries. One of the first questions of visitors from all parts of the country and abroad was always sure to be, "Where's Rag Apple?"

Science News Letter, May 22, 1948

NCE FIELDS

AERONAUTICS

Track-Tread Landing-Gear Permits Use of Soft Field

➤ TRACK-TREAD landing-gear on a heavy airplane made successful take-offs and landing on an unimproved runway at the Idlewild International Airport, New York. The track-gear performs the same function as the belt-like tread on a tractor or tank, thus spreading the weight of the plane over a greater area.

The plane equipped with the track-tread gear was a Fairchild Packet grossing 54,000 pounds. It was the first of its size to be supplied with this landing gear. This twin-engine cargo transport was chosen for the test because it was originally designed to operate in and out of short, unimproved airstrips.

The 14-inch-wide ribbed track on the steerable nose gear in the tricycle installation on the plane, and 19-inch-wide tracks on each main gear, were designed by Firestone Tire and Rubber Company. They are single-piece belts made of rubber reinforced with steel cables.

Science News Letter, May 22, 1948

MEDICINE

Worm Disease Causes Fits Like Those in Epilepsy

➤ A WORM disease that can cause fits like those in epilepsy and which may be mistaken for epilepsy or some mental trouble was reported by Lieut. Col. W. H. Hargreaves, medical liaison officer of the British Joint Services Mission, to the International Congress of Tropical Medicine and Malaria meeting in Washington.

The disease is called cysticercosis and is caused by the larval form of pork tapeworm. When the larvae get into the body they are surrounded in time by calcium. These hard lumps or cysts may be found anywhere in the body. They can sometimes be seen under the skin. When they get in the brain they may cause fits.

The condition may occur here in the United States or in any other country where pork tapeworms are found, Col. Hargreaves said. He and Dr. H. B. F. Dixon screened every British Army veteran reported to have fits and found more than 300 of them had worm cysts in their brains. Most of the men had seen service in India and apparently picked up the worm larvae there through contaminated food or drink.

Individual worm cysts can often be located with X-rays and removed, even from the brain. But since there are usually many of the cysts, this treatment is not very practical. Some patients who were going blind because of the cysts were helped by a decompression operation.

The disease has a low death rate, eight percent, and very few of the surviving patients show any signs of the disease getting worse. More than a third are improving and one-sixth, approximately, have recovered.

Science News Letter, May 22, 1948

HORTICULTURE

Pollen-Hoarding Tomato Makes Hybridizing Easy

➤ HYBRID tomatoes, with all the advantages of size, quality and abundance that go with hybrid production, are brought nearer to American tables by the discovery, at the West Tennessee Experiment Station, of a tomato plant that is unable to shed its pollen. Its significance is discussed in *Science* (May 14) by Dr. W. E. Roever.

In breeding hybrid strains of plants, it is desirable to have the female or fruit-producing individuals "male-sterile," that is, incapable of being fertilized by pollen from its own flowers. As a rule, such male-sterility is due to the production of defective pollen, or even of practically no pollen at all. This, however, imposes a handicap in that it is difficult to keep the parent line going on what few grains of good pollen can be found.

The tomato plant which Dr. Roever discovered, however, does produce good pollen, and plenty of it. But the pollen sacs at the ends of the stamens simply fail to open, so that under natural conditions in the field there is no chance for self-pollination. The parent line can be kept going with pollen artificially extracted. In the field, hybridization is assured with pollen from a different line.

This pollen-hoarding tendency is a hereditary character, capable of being transferred to new lines of tomato plants by suitable breeding procedure. Dr. Roever estimates that it will save about 75 per cent of the labor involved in hybridizing.

Science News Letter, May 22, 1948

AGRICULTURE

Four Researchers in Agriculture Get Award

➤ FOUR leading research workers of the U. S. Department of Agriculture were presented with certificates of the Department's Distinguished Service Award, at a ceremony attended by many of their colleagues.

Those honored are:

Philip V. Cardon, Bureau of Plant Industry, Soils, and Agricultural Engineering, Beltsville, Md., "for outstanding service and exceptional leadership in the advancement of agricultural science."

Dr. John I. Hardy, Bureau of Animal Industry, Beltsville, Md., "for his imagination and persistence in inventing and constructing altogether new devices for measuring important qualities of wool and other fibers."

Frederick D. Richey, Bureau of Plant Industry, Soils, and Agricultural Engineering, stationed at the Agricultural Experiment Station, University of Tennessee, Knoxville, "for outstanding service in organizing and leading the cooperative corn breeding program which gave hybrid corn to American agriculture."

William D. Smith, Grain Branch Office, Production and Marketing Administration, New Orleans, "for outstanding service to agriculture and rural life through the invention of a machine for testing milling quality of rough rice and the development of rice standards."

Science News Letter, May 22, 1948

PHOTOGRAPHY

Newly Patented Camera Uses Two Films at Once

➤ SNAPSHOTS can be taken either in color or in black-and-white with the same camera, simply by turning a knob; or any other combination of two different kinds of film can be used, in the invention on which Walter D. Teague of New York has received U. S. patent 2,439,112.

The trick is very simple. There are two film-exposing frames set back to back, with film-roll holders at either end. The entire setup is mounted in a pair of light-tight metal circles at either end, and a knob or key is provided to bring either frame into position behind the lens, as the operator may desire.

Rights in the patent have been assigned to the Eastman Kodak Company.

Science News Letter, May 22, 1948

ASTRONOMY

Jupiter Shines All Night

Mars and Saturn are the two other planets visible during June. The summer solstice, which will come on June 21, will mark the beginning of the summer season.

By JAMES STOKLEY

➤ ALTHOUGH the brightest planet of recent months is about to disappear from the evening skies, three others remain visible, along with the stars that accompany the beginning of summer.

All during the spring Venus has shone brilliantly in the west after sunset, and at the beginning of June it can still be discerned, about 22 degrees above the horizon as the sun goes down. However, it is rapidly drawing into line with the sun, reaching that position (called inferior conjunction) on June 24. A number of days before this it will be lost in the sun's glare. By mid-July it will have passed to the west of the sun, so that it will rise about two hours before sunrise, thus changing to a "morning star."

At the very beginning of June one may also glimpse the innermost planet of all—Mercury—in the west as twilight gathers. On May 28 it will be farthest east of the sun, so that it will set the longest time after sunset, and for perhaps a week after this date it can be seen at dusk near the horizon. It reaches inferior conjunction with the sun less than a day ahead of Venus.

Jupiter in Opposition

Brightest planet that is visible throughout the month of June is Jupiter, in the constellation of Sagittarius, the archer. This orb is at opposition with the sun on June 15. That means that it is in the opposite direction, and rises at sunset, remaining visible through the night. Because, at this position, the earth is on the same side of the sun as that planet, it will then be closest, with a distance of 395,800,000 miles, accounting for its brightness. On the astronomer's scale, it is of magnitude minus 2.2. Its position is indicated on the accompanying maps, which depict the skies as they appear at 11:00 p.m. (daylight saving time) on June 1 and an hour earlier at the middle of the month. Jupiter is in the southeast, above the curved tail of Scorpio, the scorpion, a group marked by the red star called Antares.

The other two planets are seen in the west, close to the star Regulus, in Leo, the lion, which stands at the end of the handle of the sickle, a hook-shaped group of stars. Mars, Regulus and Saturn stand in a row, reading from east to west. Saturn is brightest of the trio, Mars second and the star the faintest.

In addition to Regulus and Antares, seven other stars of the first magnitude are shown. Brightest is Vega, standing in the east in the figure of Lyra, the lyre. Below is the northern cross, which is part of Cygnus, the swan, resting on its side, with the star Deneb at the northern end. To the right is Aquila, the eagle, with Altair as the brightest star.

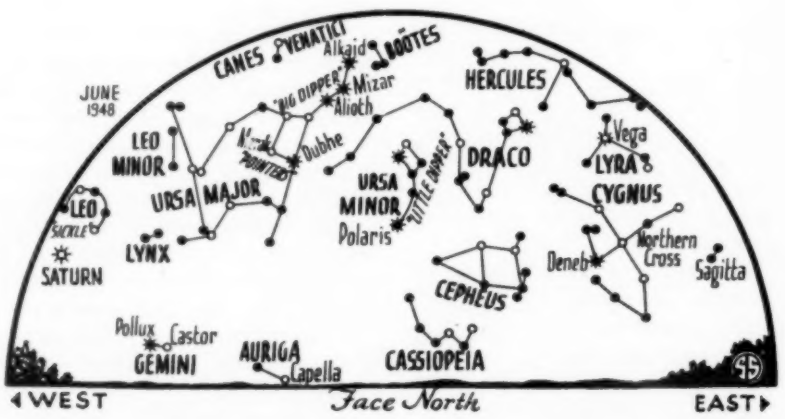
Directly overhead you can see the constellation of Bootes, the bear-driver, which is marked by the star Arcturus. Below this group, and to the left of Leo, we find Virgo, the virgin, of which the brightest star is Spica. The remaining pair of bright stars are low in the northwest, their proximity to the horizon making them seem much fainter than normal, however. One is Pollux, almost all that remains visible of Gemini, the twins, and the other, farther north, is Capella, in Auriga, the charioteer. Earlier in the evening these appear a little higher, while later they have gone below the horizon.

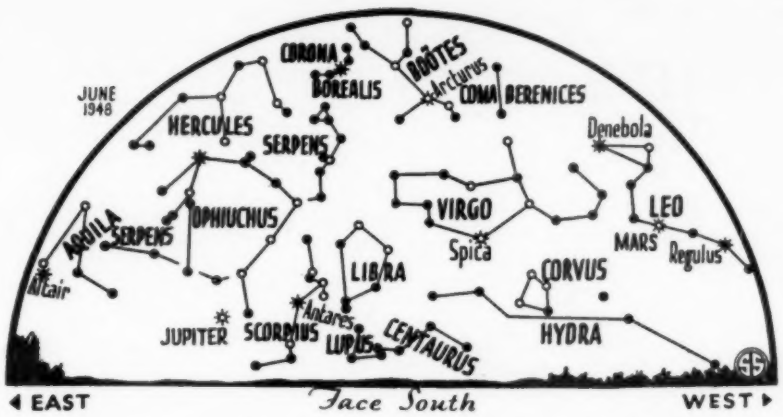
One astronomical event of June comes on the 21st, at 8:11 a.m. EDST. This is the summer solstice. Ever since last December the sun has been moving northward in the sky, the solstice marking the limit. In the northern hemisphere this is the beginning of the summer season, while in southern countries it is the first day of winter.

The planet Jupiter, closest to the earth on June 15, is by far the largest in the solar system—in fact, it is bigger than all the other planets together. With a diameter of 86,700 miles, or nearly 11 times that of the earth, it has more than 1300 times the earth's volume. However, its mass is only some 300 times that of our home planet, which means that it is much less dense, on the average. Although it is so big, it rotates far more rapidly than our planet, for it turns on its axis once in 9 hours 55 minutes. This is so rapid that the equatorial regions move at a speed of 25,000 miles an hour. Thus there is considerable centrifugal force, tending to throw these regions farther from the center, so that the diameter measured at the equator is about a fifteenth greater than that from pole to pole.

Red Spot Persists

The surface of Jupiter that we see in a telescope shows characteristic markings in the form of red and brown bands. There is one large red spot that has persisted, on and off, for more than a century. The changes in detail show that this is not a solid surface, but of clouds. With Jupiter so far away from the sun, however, these are not clouds of water, like those we see on Venus. The work of Rupert Wildt, now of Yale University Observatory, has indicated that they are clouds of frozen gases—





methane and ammonia. This theory has been confirmed by laboratory experiments.

Passing light through a long pipe containing these gases, then analyzing the light through the prisms of a spectroscope, dark bands are seen in the colored spectrum on account of the fact that certain wavelengths have been absorbed. Observations at the Mt. Wilson Observatory have shown the same bands present in the light reflected from Jupiter, proving beyond doubt that these gases are present. The colors in the clouds seem to come from compounds of metals such as sodium or potassium.

Since there are good reasons for believing that the ratio of density in Jupiter from the center to the outer part is much greater than in the earth, it seems that there must be something solid under the atmosphere. Dr. Wildt has pictured it as having a core 36,000 miles in diameter, of iron and rock, with a density of about six times that of water. Around this he assumes an ocean of compressed ice (density about 1.5) perhaps 20,000 miles deep. Around this is a layer of hydrogen and other gases, 6,500 miles thick, also compressed to a density a quarter that of water. The clouds of ammonia and methane form the outer skin.

Has Most Moons

As far as we know, Jupiter is the best provided of all the planets when it comes to moons, for 11 have been observed. There are four large ones which were discovered by Galileo in 1610—the first astronomical discoveries to be made with the then newly invented telescope. Possibly he was anticipated by a German astronomer, Simon Marius, who observed them a few months earlier, though there seems to be some doubt as to whether Marius realized that they were stars in the same direction. This was Galileo's first opinion, but it was dispelled after he observed them for a few nights and found that they moved along with the planet, encircling it as they traveled. The names which Marius proposed for them—Io, Europa, Ganymede and Callisto—are still used today. Two are larger than our moon, that of Ganymede being 3,270 miles and Callisto 3,140 miles. (The moon's diameter is 2,162 miles.)

Lick Discovery

An American astronomer, Edward E. Barnard, discovered the fifth satellite of Jupiter in 1892 while looking through the great telescope at the Lick Observatory. It is the innermost of all, with a diameter of about 150 miles. It was at the same observatory, in 1904 and 1905, that Dr. C. D. Perrine discovered photographically (as were all the rest) the sixth and seventh, which are next out from Galileo's quartet, and have diameters of 100 and 35 miles respectively. An astronomer named Melotte, at the Greenwich Observatory in England, found the eighth in 1908. Its diameter is only about 35 miles.

In 1914 Lick Observatory scored again, when Dr. Seth B. Nicholson found number nine, the diameter of which has been estimated at 17 miles. By 1938 he had become a distinguished member of the staff of the Mt. Wilson Observatory, and was taking photographs with the 100-inch telescope to record his 1914 discovery. On these plates he found two star-like objects which seemed to be travelling along with Jupiter. Further observation proved that they really were satellites, and they are numbered ten and eleven. Their diameters seem to be about 15 and 19 miles. Their orbits around Jupiter are between those of satellites five and eight. Perhaps there are still more, which will be found on future photographs.

Time Table for June

June	EDST	
7	8:55 a. m.	New moon
8	6:50 p. m.	Moon passes Mercury
9	12:24 a. m.	Moon passes Venus
10	3:00 p. m.	Moon nearest, distance 227,600 miles
11	1:18 p. m.	Moon passes Saturn
13	3:45 a. m.	Moon passes Mars
14	1:40 a. m.	Moon in first quarter
15	3:00 p. m.	Jupiter nearest, distance 395,800,000 miles
20	8:31 p. m.	Moon passes Jupiter
21	8:11 a. m.	Sun farthest north, summer commences
	8:54 a. m.	Full moon
23	11:00 p. m.	Mercury in line with sun
24	10:00 a. m.	Venus in line with sun
26	9:00 a. m.	Moon farthest, distance 251,700 miles
29	11:23 a. m.	Moon in last quarter

Subtract one hour for CDST, two hours for MDST, and three for PDST.

Science News Letter, May 22, 1948

Dry ice was found successful in creating an artificial snowstorm when sprinkled by plane in a super-cooled cloud a year ago; now 15 different types of finely-divided soil have been found to be capable of producing *snow* in the laboratory.

The world's first successful *liquid-fuel* rocket was fired 22 years ago.

Do You Know?

New Mexico claims to have enough *salt* to supply the entire Western Hemisphere for thousands of years.

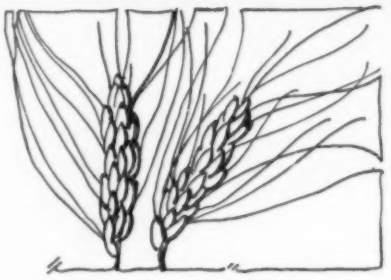
Aerial photography is saving cities millions of dollars in survey work; it is particularly helpful in planning highways and in land use studies.

Even a very thin scale deposit on the inner walls of tubes in *boilers*, caused by minerals in the water used, has a marked effect in reducing the rate of heat transfer, thus decreasing the efficiency of the boiler.

"Drunkometers" are devices now used by several American cities with persons charged with drunk-driving; the suspect blows a measured quantity of breath into a rubber bag within which is a series of tubes containing chemicals which determine the alcoholic content.

BOTANY

NATURE RAMBLINGS by Frank Thone



We Eat Weeds

➤ GARDENERS and farmers wage endless war on the plants they do not want, and stigmatize as weeds. They pull them up by the roots, they slay them with hoes and chemical sprays, they massacre them in millions with steel-bladed and flame-throwing implements. If weather or other conditions interfere with their weeding schedules they are in despair.

Yet ecologically speaking most of the crop plants they nurse so tenderly behave very much like weeds. One of the reasons why weeds prosper so annoyingly on cultivated land is that they and their cultivated rivals like exactly the same soil and moisture conditions: good, loose tilth (which means a disturbed soil), and neither too much nor too little moisture.

A great many of our cultivated plants which are known in the wild state look like weeds and for all practical purposes are weeds. They do not compete successfully with the stabilized populations of grasses and other herbs that form meadows and prairies, and they cannot thrive in the shade of woodlands, or even brushlands. They like the open, slipping, eroding soils of steep hillsides, or the often-disturbed floodplains of streams.

To take a few random samples: The wild form of wheat is a hill plant in Asia Minor, and wild oats grow in similar locations in North Africa. Wild potatoes are plants of the open on the west coast of South America, and wild tomatoes belong to the jungle-edges farther east on the same continent. Nobody has ever seen wild corn, but a shrewd guess puts its probable habitat (if it still survives) on the "wrong side of the Andes." Wild tobaccos grow on the uneasy soils of tropical American mountains.

There is further evidence in the habits of cultivated plants that have reverted to the wild. Wild lettuce and wild chicory are weeds of vacant lots, trash dumps and neglected roadsides. Wild carrot has become the familiar weed, "queen's lace", that flourishes in abandoned fields, and has to be fought hard in cultivated ones. In California, wild oats grow on open soil in open places, as does also that plant reminiscent of the Biblical parable, wild mustard.

All these once cultivated species that have "gone native" thrive so long as they have no close competition, or when the only competition is that of cultivated plants in loose soil. If their habitats are left undisturbed and become stabilized with a good, solid sod, they become less numerous and as a rule ultimately disappear.

Science News Letter, May 22, 1948

CHEMISTRY

2,4-D Increases Yield Of Turpentine and Rosin

➤ MORE efficient extraction from Southern pines of the gum that yields turpentine and rosin is promised through a 2,4-D treatment developed by C. E. Ostrom and C. S. Schopmeyer of the Southeastern Forest Experiment Station, Lake City, Fla. They have dedicated U. S. patent 2,435,724, recently issued on their discovery, to the American public for its free use.

The treatment consists simply in spraying the cuts made through the bark of the trees with a dilute solution or suspension of 2,4-D or one of its compounds. In tests conducted there, yields from treated trees were from two to seven times higher than those from similar trees that were merely slashed and not sprayed.

Science News Letter, May 22, 1948

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NOTICE: Add 20 percent Federal Excise Tax to your remittance if you buy both the Binocular Optics and the Binocular Metal Parts.

ARMY'S 6 x 30 BINOCULARS

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars (Waterproof Model). Everything you need—ready for assembly. When finished will look like a regular factory job costing $102 to $120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal parts are new and perfect, all completely finished. No machining required. Bodies factory hinged and covered. Complete assembly instructions included.

Stock ≠830-Q ..... $40.00 Postpaid
plus $8.00 tax—**Total—$48.00**

METAL PARTS ONLY—Model M-13A1, 6 x 30 Binoculars. No Optics. Same Metal Parts as described for Stock ≠830-Q.

Stock ≠832-Q—6 x 30 Metal Parts..$25.00 Postpaid

OPTICS FOR 6 x 30 BINOCULARS (No Metal Parts.) Perfect and low reflection coated.

Stock ≠5130-Q ..... **$15.00 Postpaid**

SAME OPTICS AS ABOVE—Coated—but slight seconds.

Stock ≠5124-Q.....$12.75 Postpaid

If you buy both the Binocular Optics and the Binocular Metal Parts, your purchase becomes subject to 20% Federal Excise Tax. Be sure to add amount covering tax to your remittance or your order cannot be filled.

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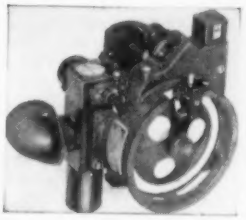

These Army Air Forces Bubble Sextants cost the Govt. about $125.00 each. A real bargain at our price of $12.50! Included with Bubble Sextant shipment is wooden Carrying Case, 5 spare waxed paper discs, flashlight with rheostat for night use (uses ordinary flashlight cells—not furnished) aux. 2-power Galilean Telescope, Allen wrench, 1 spare marking point. Wartime used. **BUT COMPLETELY REPAIRED, COLLIMATED AND PUT IN GOOD WORKING ORDER.** Light bulb has been tested—Bubble is in working condition. Because of wartime use, we make this guarantee: If not satisfied that Sextant is exactly as represented, return within 10 days and money will be refunded. Full directions for use accompany each shipment.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N. St., N. W., Washington 6, D. C. In the case of free publications order direct from issuing organization.

ANIMAL COLOUR CHANGES AND THEIR NEUROHUMOURS: A Survey of Investigations, 1910-1943—George Howard Parker *Cambridge University Press (Macmillan)*, 377 p., illus., $6.50. Devoted to the topic of how, not only the chameleon, but a variety of other creatures change color.

ANTHROPOLOGY: Race, Language, Culture, Psychology, Prehistory—A. L. Kroeber—*Harcourt, Brace*, Rev. ed., 856 p., illus., $7.50. A text also of interest to the layman who wants to know more of man's early history.

BIOGRAPHY OF THE EARTH: Its Past, Present and Future—George Gamow—*New American Library*, 194 p., illus., paper, 35 cents. A beautifully readable and engagingly illustrated book by a well-known scientist. Reprint of a book originally published by Viking but revised somewhat to bring it up to date.

CHEMICAL RUSSIAN, SELF-TAUGHT—James W. Perry—*Journal of Chemical Education*, 221 p., $3.00. The author believes it is not so difficult as you think provided you give up the idea of finding exact English equivalents of all Russian words. Alphabetical glossary included.

CHYMIA: Annual Studies in the History of Chemistry, Vol. 1—Tenney L. Davis, Ed.—*University of Pennsylvania Press*, 190 p., illus., $3.50. Selections from the Edgar Fahs Memorial Collection of rare books, manuscripts and prints relating to chemists and their works.

FUNDAMENTAL PRINCIPLES OF BACTERIOLOGY—A. J. Salle—*McGraw-Hill*, 3d ed., 730 p., illus., $6.00. For beginners in the study of bacteriology, but especially those who intended to specialize in the field. Revised and expanded.

FURTHER EXPERIENCE WITH THE RANGE FINDING TEST IN THE INDUSTRIAL TOXICOLOGY LABORATORY—Henry F. Smyth, Jr., and Charles P. Carpenter—*Mellon Institute*, 6 p., paper, free if requested direct from the publisher at the University of Pittsburgh.

ISOMERISM AND ISOMERIZATION OF ORGANIC COMPOUNDS—Ernst Davis Bergmann—*Interscience*, 138 p., $3.50. Six lectures delivered in the United States in 1946 by the director of the Weizmann Institute of Science in Rehovot, Palestine.

MARRIAGE FOR MODERNS—Henry A. Bowman—*McGraw-Hill*, 2d ed., 544 p., illus., $5.00. A text which developed out of the course on marriage at Stephens College.

PETROLEUM PRODUCTION, VOLUME IV: CONDENSATE PRODUCTION AND CYCLING—Park J. Jones—*Reinhold*, 238 p., illus., $5.00.

SAADIA GAON, THE BOOK OF BELIEFS AND OPINIONS—Translated from the Arabic and Hebrew by Samuel Rosenblatt—*Yale University Press*, 496 p., $5.00. The first systematic presentation of Judaism as a rational body of beliefs. By a scholar who lived from 882 to 942.

SEX HABITS OF AMERICAN MEN: A Symposium on the Kinsey Report—Albert Deutsch, Ed.—*Prentice-Hall*, 244 p., $3.00. Discussion of the social, religious and other implications of a much-talked-about book.

STRENGTH OF MATERIALS—Joseph Marin—*Macmillan*, 464 p., illus., $4.75. Text for a first course in this subject.

VICTOR ROBINSON MEMORIAL VOLUME, ESSAYS ON HISTORY OF MEDICINE: In Honor of Victor Robinson on His Sixtieth Birthday, August 16, 1946—Solomon R. Kagan, Ed.—*Froben*, 447 p., illus., $10.00. The tribute of 38 authors to a leader in their field. Edition limited to 350 copies.

WORLD HEALTH ORGANIZATION—PROGRESS AND PLANS—H. van Zile Hyde—*Department of State*, 23 p., paper, free upon request direct to U. S. Department of State, Washington 25, D. C. Includes text of the constitution of WHO. This is the first specialized agency of the United Nations of which the U. S. has not been a member at the time of entry into force of its constitution.

Science News Letter, May 22, 1948

SEISMOLOGY

New Earthquake Indicator Records at Distance

➤ A SEISMOGRAPH, or earthquake-recording instrument, of radically new type has been developed at Harvard University by a graduate student in geology, Roland K. Blumberg of Seguin, Texas. Instead of writing the squiggly line that is a distant earthquake's signature by a dancing dot of light on a sheet of photographic paper, it translates the impulses into electrical terms, thereby making it possible to install the recording end of the setup at any convenient distance from the wave-detecting mechanism, and to have the record made by a fountain pen on a strip of ordinary paper.

Whereas in existing seismological equipment it is necessary to have three instruments oriented on three axes—north-south, east-west and vertical—to make a complete record of the shape of an earthquake's waves, with the new design a single instrument suffices for all three. It drives three pens on the recorder, thus making a simultaneous triple record of every earthquake.

First installation of the new instrument has been made at the University's observatory at Harvard, Mass., Prof. Don Leet announces. The first major disturbance that was registered on its paper tape was the disastrous Philppine earthquake of Jan. 24.

Science News Letter, May 22, 1948

AERONAUTICS

International Aviation Aided by New Standards

➤ WORLD-WIDE civilian air transport services will be safer and easier with the adoption in Montreal of five sets of standards by the Council of the International Civil Aviation Organization for the 47 nations, including the United States, represented in the association.

The standards approved include the licensing of pilots and crews, uniform aeronautical maps and charts, rules of the air, dimensional practices and meteorological codes. They have been sent to the member nations for consideration and it is hoped will be enacted into the legislative codes of each.

The first standard lays down the technical requirements and experiences necessary for pilots, navigators and air crews flying international routes. The second will assure maps and charts which all pilots and navigators will be able to use no matter where they may be. The third, the rules of the air, include general flight rules and right-of-way rules. They are the equivalent of road rules for ground motor vehicles.

The rules for dimensional practices are intended to do away with the present confusion caused by the use of both metric and foot-pound-second units in air-ground communications. The meteorological codes specify the various agreed systems used for the transmission of weather information.

Science News Letter, May 22, 1948

ELECTRONICS-AERONAUTICS

VHF Radio for Small Planes Transmits in Bad Weather

➤ NEW small radios for private planes that permit communication with airports in all types of weather were revealed by General Electric. They have an effective range of 50 miles over level terrain from an altitude of 5,000 feet.

The radio transmitting set, weighing less than three pounds is able to get a message through under bad-weather conditions because it operates at frequencies ranging from 121,500 to 122,900 kilocycles, relatively unaffected by thunderstorms and other climatic conditions. It uses less than one-tenth the power of a conventional private-plane transmitter, and is designed to take advantage of the six radio frequencies recently allocated by the Federal Communications Commission for personal planes.

Science News Letter, May 22, 1948

• New Machines and Gadgets •

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., Washington 6, D. C. and ask for Gadget Bulletin 415. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

❁ *SAFETY RAIL for the bathtub fits anywhere crosswise in the tub, gripping the sides firmly enough to support a considerable weight. This chrome-plated brass rod, designed to fit all standard bath tubs, is easily and quickly installed by merely opening or closing two adjusting nuts.*

Science News Letter, May 22, 1948

❁ *APPLE PRESERVER, a machine for purifying the air in storage chambers, is claimed to add four to six weeks to storage life. By means of a motor and fan, it draws the air through a filter of activated carbon to remove ethylene, which accelerates ripening, and the "scald" which causes brownish discolorations.*

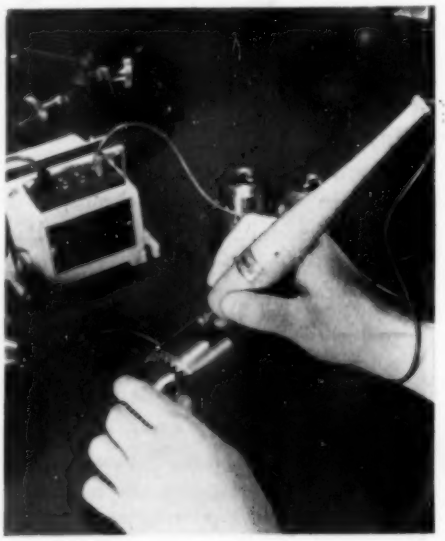
Science News Letter, May 22, 1948

❁ *FERTILIZER UNIT, for applying liquid food to lawns and flowers, is a metal coupling to attach between faucet and garden hose which has a suction tube on one side. When the end of this tube is stuck into a pail of a fertilizer solution, the liquid is drawn up and into the hose stream thus delivering "enriched" water to the plants.*

Science News Letter, May 22, 1948

❁ *ELECTRIC PENCIL, which writes on steel in six different grades of writing strength, is a British device which operates on a system of magnets causing vibrations of a spring and the needle. It operates on a battery or with a special light transformer. The picture shows it writing on a steel chuck.*

Science News Letter, May 22, 1948



❁ *GOLF BALL, claimed to rebound 20% higher when dropped 20 feet than other balls in the same price class, owes its increased resiliency to the better quality transmitting liquid used in it. The ball permits the use of shorter clubs which, in turn, assure better control and, therefore, fewer strokes.*

Science News Letter, May 22, 1948

❁ *MOISTURE-ABSORBER chemical, a harmless, tasteless material when eaten, will keep salt free-running from the shaker in the most damp climates. When sprinkled in the bottom of a cookie jar, it will keep the cookies crisp and tasty, and it can also be used to protect goods in storage from dampness.*

Science News Letter, May 22, 1948

❁ *BRAKE-MASTER, for insertion in hydraulic brake pressure line in automobiles between the so-called master cylinder and the brakes themselves, provides automatic adjustment of the brakes to compensate for brake lining wear. It is made of die-cast aluminum with a brass cylinder insert for added strength.*

Science News Letter, May 22, 1948

Question Box

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How can flight training be given on the ground? p. 325.

ASTRONOMY

What is the brightest planet in the May sky? p. 330.

CONSERVATION

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MEDICINE

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What drug is better than morphine for the pain of cancer? p. 323.

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NUTRITION

How much must you eat for good health? p. 327.

PSYCHOLOGY-FORESTRY

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Photographs: Cover, Fremont Davis; p. 323, U. S. Navy; p. 325, Pan American; p. 327, Du Pont; p. 336, British Information Services.